

I claim:

1. A puncture sealing composition for a tubeless pneumatic tire comprising a fiber-free blend of

5 A. a minor proportion by weight of a low molecular weight liquid elastomer in admixture with a tackifying or plasticizing substance, and

B. a major proportion by weight of a high molecular weight solid elastomer, and a crosslinking agent for the elastomers in amount effective to partially crosslink the elastomers to an extent sufficient to prevent the blend from flowing at elevated
10 temperatures and centrifugal forces encountered in the tire in use, the blend having in the partially crosslinked state sufficient adhesion and conformability to function as a sealant in the tire, the amount of (A) being from more than 50% to 10% by weight and the amount of (B) being correspondingly from less than 50% to 90% by weight, based on the combined weights of (A) and (B), the said low molecular weight elastomer being a liquid
15 rubber having a Brookfield viscosity at 150.degree. F of from 20,000 to 2,000,000 cps and the said high molecular weight elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212.degree. F, the said crosslinking agent being selected from the following, present in the amounts recited:

from more than 0.5 to 2.0 parts of sulfur or sulfur-yielding curative;
20 from more than 0.5 to 2.0 parts of quinoid curative;
from 0.1 to 1.0 part of radical generating curative;
from 2 to 10 parts of polyisocyanate curative; and
from 2 to 10 parts of tetrahydrocarbyl titanate ester curative,

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the said parts of crosslinking agent being by weight based on 100 parts of the combined weight of the two elastomers, the gel content of the blend in the partially crosslinked state being from 15 to 60% by weight of the blend, as measured in toluene at room temperature, and the peak Mooney viscosity of the blend in the partially crosslinked state being from 15 to 55 ML at 150.degrees F; and

C. ground rubber from used tires in the amount of up to 5 percent by weight of the sealant composition.

2. A puncture sealing composition as in claim 1 in which the liquid rubber is heat depolymerized natural rubber.

3. A puncture sealing composition as in claim 1 in which the low molecular weight elastomer is selected from the group consisting of liquid cis-polyisoprene, liquid polybutadiene, liquid polybutene, liquid ethylene-propylene-non-conjugated diene terpolymer rubber, and liquid isobutylene-isoprene copolymer rubber.

4. A puncture sealing composition as in claim 1 in which the high molecular weight elastomer is selected from the group consisting of conjugated diolefin homopolymer rubbers, copolymers of a major proportion of a conjugated diolefin with a minor proportion of a copolymerizable monoethylenically unsaturated monomer, copolymers of isobutylene with a small amount of isoprene, ethylene-propylene-non-conjugated diene terpolymers, and saturated elastomers.

5. A puncture sealing composition as in claim 1 in which (A) is liquid heat depolymerized natural rubber in admixture with a resin prepared from the reaction of a mineral oil purification residue with formaldehyde and with nitric acid catalyst and (B) is solid cis-polyisoprene rubber.

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6. A puncture sealing composition as in claim 1 in which the tackifying or plasticizing substance is selected from resin esters, aliphatic petroleum hydrocarbon resins, polyterpene resins, styrene resins, dicyclopentadiene resins, and resins prepared from the reaction of a mineral oil purification residue with formaldehyde and with a nitric acid

10 catalyst.

7. A puncture sealing composition for a tubeless pneumatic tire comprising a blend of

A. from more than 50% to 10% by weight of low molecular weight liquid elastomer having a Brookfield viscosity at 150 degrees F of from 20,000 to 1,000,000 cps

15 in admixture with a plasticizing or tackifying substance, and

B. correspondingly from less than 50% to 90% by weight of high molecular weight solid elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212 degrees F, said blend being partially crosslinked to an extent sufficient to provide in the blend a gel content of from 20 to 50% by weight of the blend as measured in toluene at
20 room temperature and a peak Mooney viscosity of from 15 to 55 ML at 150.degree. F, whereby the blend is prevented from flowing at elevated temperatures and centrifugal forces encountered in the tire in use and the blend has sufficient adhesion and conformability to

function as a sealant in the tire

and

C. ground rubber from used tires in the amount of up to 5 percent by weight of the sealant composition.

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8. A puncture sealing composition for a tubeless pneumatic tire comprising a blend of

A. from more than 50% to 10% by weight of a low molecular weight liquid elastomer having a Brookfield viscosity at 150.degree. F of from 20,000 to 1,000,000 cps

10 in admixture with a plasticizing or tackifying substance, and

B. correspondingly from less than 50% to 90% by weight of a high molecular weight solid elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212

degrees F, and from 2 to 10 parts, per 100 parts by weight of the two elastomers, of a tetraalkyl titanate ester crosslinking agent in which the alkyl groups have from 1 to 12

15 carbon atoms, said blend being partially crosslinked by the said crosslinking agent to provide in the blend a gel content of from 20% to 50% by weight based on the weight of

the blend as measured in toluene at room temperature and a peak Mooney viscosity of from 15 to 55 ML at 150 degrees F, whereby the blend is prevented from flowing at

elevated temperatures and centrifugal forces encountered in the tire in use and the blend

20 has sufficient adhesion and conformability to function as a sealant in the tire, and

C. ground rubber from used tires in the amount of up to 5 percent by weight of the sealant composition.

9. A puncture sealing composition for a tubeless pneumatic tire comprising a blend of

A. from more than 50% to 10% by weight of liquid heat depolymerized natural
5 rubber having a Brookfield viscosity at 150 degrees F of from 20,000 to 2,000,000 cps in
admixture with a plasticizing or tackifying substance, and

B. correspondingly from less than 50% to 90% by weight of cis-polyisoprene
elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212 degrees F,
said blend being partially crosslinked to an extent sufficient to provide in the blend a gel
10 content of from 15 to 60% by weight of the blend as measured in toluene at room
temperature and a peak Mooney viscosity of from 15 to 55 ML at 150 degrees F,
whereby the blend is prevented from flowing at elevated temperatures and centrifugal
forces encountered in the tire in use and the blend has sufficient adhesion and
conformability to function as a sealant in the tire; and

15 C. ground rubber from used tires in the amount of up to 5 percent by weight of the
sealant composition.

10. A puncture sealing composition for a tubeless pneumatic tire comprising a blend of

20 A. from more than 50% to 10% by weight of liquid heat depolymerized natural
rubber having a Brookfield viscosity at 150 degrees F of from 20,000 to 1,000,000 cps
and a resin prepared from the reaction of a mineral oil purification residue with
formaldehyde and with nitric acid catalyst with

B. correspondingly from less than 50% to 90% by weight of cis-polyisoprene elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212 degrees F, and from 2 to 10 parts, per 100 parts by weight of the two elastomers, of a tetraalkyl titanate ester crosslinking agent in which the alkyl groups have from 1 to 12 carbon atoms, said blend being partially crosslinked by the said crosslinking agent to provide in the blend a gel content of from 15 to 60% by weight based on the weight of the blend as measured in toluene at room temperature and a peak Mooney viscosity of from 15 to 55 ML at 150 degrees F, whereby the blend is prevented from flowing at elevated temperatures and centrifugal forces encountered in the tire in use and the blend has sufficient adhesion and conformability to function as a sealant in the tire; and

C. ground rubber from used tires in the amount of up to 5 percent by weight of the sealant composition.

11 ~~12.~~ The puncture sealing composition of claim 1, wherein the ground rubber is 40 mesh or finer.

12 ~~13.~~ A tire including the composition of any of claims 1-~~12~~¹¹.